Amendments to the Claims

The following Listing of Claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method for arranging a set of objects within an area, comprising:

~~(a)~~ initiating a first current binary tree comprising a leaf node; ~~and~~

associating a first object selected from the set with the ~~binary tree~~leaf node;

~~(b) selecting a subsequent object not included in the binary tree;~~

~~(c)~~ establishing ~~at least one~~ candidate binary trees, wherein each of the candidate binary trees comprises the current binary tree and a respective leaf node associated with another object selected from the set, and locations of the leaf nodes within each of the candidate binary trees correspond to relative positions of the associated objects within the area ~~objects from the binary tree and the subsequent object~~;

~~(d)~~ computing a respective score for each of the candidate binary trees ~~and~~

selecting one of the candidate binary trees as the current binary tree based on the computed scores ~~having a highest score associated with placement of the subsequent object~~;

~~(e)~~ repeating ~~(b), (c), and (d)~~the establishing, the computing, and the selecting until the current binary ~~candidate~~ tree includes all the objects in the set ~~of objects~~; and

~~(f)~~ after the repeating, arranging the objects within the area in accordance with the locations of the leaf nodes within the current binary~~candidate~~ tree.

Claim 2 (currently amended): The method of claim 1, wherein the current binary tree comprises:

at least one interior node; and

at least one leaf node emanating from ~~one~~the interior node;

wherein ~~a~~ each subtree of the current binary tree comprises a respective position within the current binary tree and all interior nodes and ~~leaves~~leaf nodes emanating from the respective position; and

wherein ~~a~~each subtree of each of the candidate binary trees comprises a respective location within the candidate binary tree and all interior nodes and ~~leaves~~leaf nodes emanating from the respective location.

Claim 3 (currently amended): The method of claim 2, wherein the establishing ~~each candidate tree is performed by modifying the binary tree, where the step of modifying~~ comprises:

~~a.~~ removing ~~one~~ a subtree of the current binary tree associated with ~~one desired~~a selected position within the current binary tree;

~~b.~~ inserting a new interior node into the current binary tree at the ~~desired~~selected position;

~~c.~~ associating either a horizontal or a vertical ~~cut~~partition of the area with the new interior node;

~~d.~~ inserting into the binary tree a new leaf node ~~into the binary tree~~ emanating from the new interior node;

~~e.~~ associating the new leaf node with the ~~subsequent~~other object selected from the set; and

~~f.~~ inserting the previously removed subtree ~~into the binary tree, said subtree also emanating from~~ back into the binary tree at the new interior node.

Claim 4 (currently amended): The method of claim 3, wherein the ~~desired~~ selected position ~~may be one~~is selected from ~~a~~ the group ~~comprising~~consisting of:

a leaf node in the current binary tree; and

an interior node in the current binary tree.

Claim 5 (currently amended): The method of claim 2, further comprising normalizing each of the candidate binary trees ~~after establishing the candidate tree~~, wherein the normalizing comprises:

~~a.~~ for each of the interior nodes in the candidate binary tree, characterizing a respective bounding box ~~of~~for the objects included in the subtree rooted in the interior node; and

~~b.~~ for each of the objects, allocating a respective region of the area in accordance with the respective bounding box ~~for each object~~.

Claim 6 (currently amended): The method of claim 1, wherein the computing ~~the score for each candidate tree~~ comprises determining ~~a~~ respective fractions of the areas occupied by the objects in each of the candidate binary trees, and ~~wherein~~ the selecting ~~one candidate tree~~ comprises ~~determining~~ selecting as the current binary tree the candidate binary tree having a greatest one of the fractions of the area occupied by the objects in ~~each~~the candidate binary tree.

Claim 7 (currently amended): The method of claim 1, wherein the computing ~~the score for each candidate tree~~ comprises assessing minimum and maximum ~~values for~~ object ~~sizes~~ size values for all the objects in the area, and ~~wherein~~ the selecting ~~one candidate tree~~ comprises ~~determining~~ selecting as the current binary tree the candidate binary tree having ~~the~~ a greatest respective ratio of minimum area object size value divided by maximum area object size value.

Claim 8 (currently amended): A method for arranging a set of objects within an area, comprising:

establishing a tree structure;

associating a first object selected from the set with the tree structure to form a current candidate tree;

modifying the current candidate tree to form ~~at least one~~ alternate candidate trees by associating a subsequent object selected from the set with ~~at least one available~~different respective locations on the current candidate tree, wherein the respective locations correspond to relative positions of the associated objects within the area;

computing scores for each of the alternate candidate trees ~~with the subsequent object in each available location~~;

selecting one of the alternate candidate trees as the current candidate tree based on the computed scores ~~having a best score~~;

~~designating the selected alternate candidate tree to be the candidate tree;~~

repeating ~~said~~ the modifying, the computing, and the selecting ~~and designating for~~until all ~~remaining subsequent~~the objects in the set are associated with the current candidate tree; and

after the repeating, arranging all the ~~set of~~ objects in the set within the area in accordance with the locations in the current candidate tree associated with the objects.

Claim 9 (currently amended): The method of claim 8, wherein each of the tree structure, the candidate trees, ~~each~~and the alternate candidate trees~~, and the selected alternate candidate tree each~~ comprises:

at least one interior node; and

at least one leaf node emanating from ~~one~~the interior node;

wherein ~~a~~ each subtree of the current candidate tree comprises a respective location within the current candidate tree and all interior nodes and ~~leaves~~leaf nodes emanating from the respective location;

wherein ~~a~~ each subtree of each of the alternate candidate trees comprises a respective spot within the alternate candidate tree and all interior nodes and ~~leaves~~leaf nodes emanating from the spot.

Claim 10 (currently amended): The method of claim 9, wherein the modifying ~~the candidate tree~~ comprises:

~~a.~~ removing ~~one~~ a subtree of the current candidate tree associated with one ~~desired~~ selected location within the current candidate tree;

~~b.~~ inserting a new interior node into the current candidate tree at the selected~~desired~~ location;

~~c.~~ associating either a horizontal or a vertical ~~cut~~ partition of the area with the new interior node;

~~d.~~ inserting into the current candidate tree a new leaf node ~~into the candidate tree~~ emanating from the new node;

~~e.~~ associating the new leaf node with the subsequent object selected from the set; and

~~f.~~ inserting the previously removed subtree back into the current candidate tree at ~~into the candidate tree, said subtree also emanating from~~ the new interior node.

Claim 11 (currently amended): The method of claim 10, wherein the ~~desired~~ selected location ~~may be one~~is selected from ~~a~~ the group ~~comprising~~consisting of: a leaf node in the current candidate tree; and an interior node in the current candidate tree.

Claim 12 (currently amended): The method of claim 9, further comprising normalizing each of the alternate candidate trees ~~after modifying the candidate tree~~, wherein for each of the alternate candidate trees the normalizing comprises:

~~a.~~ for each of the interior nodes in the alternate candidate tree, characterizing a respective bounding box ~~of~~for the objects included in the subtree rooted in the interior node; and

~~b.~~ for each of the objects, allocating a respective region of the area in accordance with the respective bounding box ~~for each object~~.

Claim 13 (currently amended): The method of claim 8, wherein the computing ~~scores~~ comprises determining respective ~~a~~ fractions of the area occupied by the objects in each of the alternate candidate trees, and ~~wherein~~ the selecting ~~the alternate candidate tree having a best score~~ comprises ~~determining~~ selecting as the current candidate tree the alternate candidate tree having a greatest one of the fractions of the area occupied by the objects in ~~each~~the alternate candidate tree.

Claim 14 (currently amended): The method of claim 8, wherein the computing ~~scores~~ comprises assessing minimum and maximum ~~values for~~ object ~~sizes~~ size values for all objects in the area for each alternate candidate tree, and ~~wherein~~ the selecting ~~the alternate candidate tree having a best score~~ comprises ~~determining~~ selecting as the current candidate tree the alternate candidate tree having a greatest respective ratio of minimum object size value divided by maximum object size value.

Claim 15 (currently amended): A method for arranging a set of objects within an area, comprising:

establishing a current candidate tree having at least one interior node, ~~and~~ at least one leaf node connected to ~~one~~the interior node, and at least one object selected from the set associated with the ~~candidate tree~~leaf node;

modifying the current candidate tree to form ~~at least one~~ alternate candidate trees by associating a subsequent object selected from the set with ~~at least one available~~ a different respective location on the current candidate tree, wherein the respective locations correspond to relative positions of the associated objects within the area;

computing scores for each of the alternate candidate trees ~~with the subsequent object in each available location~~;

selecting one of the alternate candidate trees as the current candidate tree based on the computed scores ~~having a best score, and designating the selected alternate candidate tree to be the candidate tree~~;

repeating ~~said~~ the modifying, the computing, and the selecting ~~for all remaining subsequent objects~~until all the objects in the set are associated with the current candidate tree; and

after the repeating, arranging all the ~~set of~~ objects in the set within the area in accordance with the locations in the current candidate tree associated with the objects.

Claim 16 (currently amended): The method of claim 15, wherein ~~a~~each subtree of the current candidate tree comprises a respective location within the current candidate tree and all interior nodes and ~~leaves~~leaf nodes emanating from the respective location, and ~~wherein a~~ each subtree of each of the alternate candidate trees comprises a respective spot within the alternate candidate tree and all interior nodes and ~~leaves~~leaf nodes emanating from the respective spot.

Claim 17 (currently amended): The method of claim 16, wherein modifying the candidate tree comprises:

~~a.~~ removing ~~one~~ a subtree of the current candidate tree associated with one ~~desired~~ selected location within the current candidate tree;

~~b.~~ inserting a new interior node into the current candidate tree at the ~~desired~~ selected location;

~~e.~~ associating either a horizontal or a vertical ~~cut~~ partition of the area with the new interior node;

~~d.~~ inserting into the candidate tree a new leaf node ~~into the candidate tree~~ emanating from the new interior node;

~~e.~~ associating the new leaf node with the subsequent object selected from the set; and

~~f.~~ inserting the previously removed subtree back into the candidate tree at ~~into the candidate tree, said subtree also emanating from~~ the new interior node.

Claim 18 (currently amended): The method of claim 17, wherein the ~~desired~~ selected location ~~may be one~~is selected from ~~a~~ the group ~~comprising~~consisting of:

a leaf node in the current candidate tree; and

an interior node in current the candidate tree.

Claim 19 (currently amended): The method of claim 16, further comprising normalizing each of the alternate candidate trees ~~after modifying the candidate tree~~, wherein for each of the alternate candidate trees the normalizing comprises:

~~a.~~ for each of the interior nodes in the alternate candidate tree, characterizing a respective bounding box ~~of~~for the objects included in the subtree rooted in the interior node; and

~~b.~~ for each of the objects, allocating a respective region of the area in accordance with the respective bounding box ~~for each object~~.

Claim 20 (currently amended): The method of claim 15, wherein the computing ~~scores~~ comprises determining ~~a~~ respective fractions of the area occupied by the objects in each of the alternate candidate trees, and ~~wherein~~ the selecting ~~the alternate candidate tree having a best score~~ comprises ~~determining~~ selecting as the current candidate tree the alternate candidate tree having a greatest one of the fractions of the area occupied by the objects in ~~each~~ the alternate candidate tree.

Claim 21 (currently amended): The method of claim 15, wherein the computing ~~scores~~ comprises assessing minimum and maximum ~~values for~~ object ~~sizes~~ size values for all

objects in the area for each of the alternate candidate trees, and ~~wherein~~ the selecting ~~the alternate candidate tree having a best score~~ comprises ~~determining~~ selecting as the current candidate tree the alternate candidate tree having a greatest respective ratio of minimum object size value divided by maximum object size value.